

## PUPA.

Length, 4 mm. ; breadth, 2 mm.

Enclosed within the larval skin, and visible only from above, where the larval skin is longitudinally split open along the median dorsal line from head to anal segment. Abruptly narrows to a point at the anal extremity. Removed from larval skin, the entire surface of the pupa is seen to be covered with short, soft, light yellowish brown hairs, except at the centre of dorsal surface which contains three minute transverse incisions or furrows. The anterior margin of each furrow is straight while the posterior margin is curved. Examined under the microscope, both margins of each incision are seen to be minutely dentate, but the teeth of the posterior margins are

more prominent than those of the anterior margins. The incisions being in the outer layer of the skin only, these minute teeth may be of use in fixing the pupal skin while the imago emerges from it.

The imagos, first appearing about the middle of March, continue to appear during all the spring and summer months.

For several years this was the only museum pest whose presence was dreaded in the entomological cabinets of the University of Kansas, but for the past three years *Anthrenus varius* has become quite as formidable a foe, having been introduced into the building in some eastern bird skins. Careful watching and the use of tight boxes have prevented serious damage to the collections from either of these pests.

ORGANS, PROBABLY DEFENSIVE IN FUNCTION, IN THE LARVA OF  
*HYPERCHIRIA VARIA*, WALK. (*SATURNIA IO*, HARRIS).

BY GEORGE DIMMOCK, CAMBRIDGE, MASS.

In examining a larva of *Hyperchiria varia* lately I found on each side a protrusile organ just posterior to, and a trifle below the level of the stigmata of the fourth segment, and a similar organ in the same position relative to the stigmata of the tenth segment, these segments being counted from and excluding the head.

These organs, when retracted, exhibit nothing more than an irregular opening, about half a millimetre in diameter, situated in the reddish lateral line which extends from the anterior part of the fourth segment to the posterior extremity of the

larva. In this position they may be easily mistaken for some of the folds of the skin which are numerous along the lateral parts of this larva when at rest.

If the larva be disturbed by slightly touching the spines with which it is covered, and at the same time attention be given to the above-mentioned irregular openings, which should be observed under a lens, each opening will be seen to evaginate and to re-invaginate alternately. When evaginated to about a half a millimetre in height above the surrounding skin the appearance of the organ is very similar to that of a minute sea-anemone or actinia

with its tentacles retracted, and this resemblance is enhanced by the flesh-like aspect of the whole extended portion of the organ, its color being about the same as that of the reddish lateral line in which it is situated. The organ is usually evaginated, as above described, upon any slight disturbance of the larva, to a distance of about .75 mm.

If the larva is greatly disturbed, especially suddenly, as by a sharp, quick stroke on the spines or by a pinching of the skin, the organ is sometimes further evaginated, a moment only, to over a millimetre in length. The distal extremity, when fully evaginated, is rounded, being terminated by a hemispheroidal portion of more delicate texture and of slightly lighter color than the proximal portion.

This organ is probably the opening of a gland, altho it never appears moist. The abundant moisture, however, which usually indicates glandular secretion in insects is not a necessary character of such secretion, any more in insects than in vertebrates. Silk and the woolly masses on aphides are examples of nearly dry solid secretions in insects, while the gas, permanent under ordinary conditions, which is emitted from the anal glands of *Brachinus* shows that an insect secretion may either be gaseous or become gas directly upon its emission. So the absence of appreciable moisture is no sure proof that the organs under consideration are not glandular. There is no odor about these organs, as far as I could determine, nor did their surface show either acid or alkaline reaction upon being touched with moistened litmus paper.

The function of these organs seems to be to defend the larva, already so thoroughly

protected from many dangers by its urticating spines, from some kind of attack, for the organs are not in use when the larva is undisturbed and are more active in their protrusion and retraction the more the larva is disturbed. Their function may be to drive away some parasite, for against the attacks of ichneumons the sharp spines of this larva are an inadequate defense.

The improbability of four such organs as those described above escaping the notice of all the entomologists who had carefully examined the larva of *Hyperchiria varia* led me to look up all the accessible descriptions of that larva, but I found no mention of these organs in any of them. Harris, in his Entomological Correspondence,<sup>1</sup> and Riley, in his Fifth Report,<sup>2</sup> give quite extended descriptions of the larva and locate the different series of spiculiferous tubercles, but entirely overlook the organs which are the subject of this note.

As I have neither time nor material for the extended study of these organs I publish this brief note on their external appearance in the hope that some one will study them further, especially in regard to their internal structure and to determine their functions with certainty. It would be of interest to note whether the larva possesses these organs in all its different stages, a point which I was unable to settle because of having no very young larvae.

Cambridge, 7 Sept. 1882.

<sup>1</sup> Occasional papers of the Boston society of natural history. 1. Entomological correspondence of Thaddeus William Harris, M. D. Edited by Samuel H. Scudder. Boston, 1869. p. 295-297.

<sup>2</sup> Fifth annual Report on the noxious, beneficial and other insects of the state of Missouri, . . . by C. V. Riley, state entomologist. Jefferson City, 1873. p. 135.